Metacognition in First Episode Psychosis: Item Level Analysis of Associations with Symptoms and Engagement.

Metacognition in first episode psychosis: item level analysis of associations with symptoms and engagement

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Abstract

Significant metacognitive impairments are observed in first episode psychosis (FEP) and chronic psychosis samples. There is evidence for associations between metacognition and presentation in FEP but the relative contribution of metacognitive understanding of the self and the other is as yet unclear. The current study is a secondary analysis of date on metacognition, symptoms and engagement with treatment (helpseeking) in an FEP sample. In a cross-sectional cohort study, individuals in the first 12 months of treatment metacognition were assessed with the Metacognition Assessment Scale-Revised version (MAS-R). Psychotic symptomatology and helpseeking within treatment (clinician rated service engagement) were also measured. An item level analysis of the MAS-R was conducted exploring associations between symptoms and cognitive, emotional, differentiation, integration and decentration aspects of metacognition. We report that associations between negative symptoms and deficits in the Understanding of Other's mental states extend across cognitive, emotional, integrative and decentration aspects of metacognition. We also report associations between negative symptoms and Understanding One's Own Mind. We also note that cognitive and decentration aspects of metacognition were significantly associated with helpseeking once in treatment. Our findings suggest that an appreciation of metacognitive processes may inform treatment frameworks for FEP.

Keywords: psychosis, first episode, metacognition, help-seeking.

Key Practitioner Messages:

- Individual components of metacognition, including the capacity to relate cognitive and emotional variables are important in FEP.
- Impaired metacognitive understanding of both One's own and Others' mental states is associated with increased negative symptoms
- Metacognitive variables may be important in understanding how different individuals seek help or engage with services after the initiation of treatment.

Introduction

A relevant feature of core pathology of long-term schizophrenia appears to be poor metacognition, defined here as the set of abilities needed to make sense of one's own mental states, the mental states of others, and using one's awareness of mental states to master suffering and handle relational problems. Metacognition includes both awareness of specific elements such as naming an emotion one experiences or inferring other peoples thoughts from facial expressions or behaviors, to more synthetic judgments integrating psychological knowledge about the self and the others into complex psychological representations (Carcione et al., 2010; Dimaggio & Lysaker, 2010; Lysaker et al., 2013; Semerari et al., 2003). It also involves mastery - the ability to use information about the mental states of both oneself and others to solve social problems and realize one's wishes in the interpersonal realm.

A series of studies conducted across different countries have consistently replicated Lysaker and colleagues (2005; 2007) original findings that individuals with schizophrenia display impaired metacognition, and that this diminished capacity is related to symptoms, neurocognition, and social and vocational functioning. In particular, metacognition is associated with negative symptoms (Lysaker et al., 2007; 2012; Nicolò et al., 2012; Mitchell et al., 2012) and disorganization symptoms (Lysaker et al., 2007). Reduced self-reflection is related to poorer therapeutic outcomes (Lysaker et al., 2010) and reduced ability to judge one's own occupational performance (Leudtke et al., 2012). Metacognitive mastery predicted both concurrent and subsequent interviewer-rated quality of life (Lysaker et al., 2011a) and patients enrolled in a cognitive rehabilitation program with higher mastery and intrinsic motivation improved more in a learning paradigm (Tas et al., 2012). Poor metacognition has also been consistently associated with poor insight into illness (Lysaker et al., 2005; Nicolò et al., 2012). Furthermore, for a sub-population of individuals with schizophrenia, a history of trauma was related to reduced abilities to understand the mental state of others, without a comparable impairment in understanding ones own mental state (Lysaker et al., 2011b). In patients with schizophrenia and violent behaviour poorer metacognition associated with aggression; premeditated aggression was related with relatively intact "cognitive", but severely impaired "affective" metacognitive abilities. In contrast, impulsive aggression was related to difficulties in both cognitive and affective processing of mental states (Bo et al., 2013; 2014).

To date there has been little evidence on the role of metacognition in younger individuals presenting with First Episode Psychosis (FEP). This is a particularly relevant issue as detecting problems in metacognition at this stage may help identify treatment targets in a period when the illness is more malleable, not fully established and psychological interventions may affect positively the course of illness (Álvarez-Jiménez et al., 2011). Vohs and colleagues (2014) reported

that both FEP and prolonged psychosis patients displayed impaired metacognition as compared to a control group with substance abuse. FEP and prolonged patients did not show significant differences between each other, except a somewhat surprising finding that awareness of the mental states of the others was better in the prolonged psychosis group. This may have been linked to the period of distress following a first episode that then recedes after appropriate care, but in any case shows how metacognitive dysfunctions are a feature of the early phase of illness. Metacognitive problems in FEP patients predicts positive and negative symptoms 12 months later, suggesting that this is a significant contributor to suffering and social dysfunction as early as in the very first stages of the disease (McLeod et al., 2014). Abilities such as reading facial emotions are reduced in young people with psychosis, a problem associated with greater negative and positive symptoms as compared with controls with bipolar disorder or depression (Guastella et al., 2013). Early psychosis patients' difficulties with understanding others' mental states is also evident on tasks that involve sequencing humorous pictures that require inferences about story characters beliefs (Langdon et al., 2013). Unlike in later stages of the disease, theory of mind in individuals with FEP is not consistently associated with social functioning (Sullivan et al., 2013). These discrepancies may depend on the type of measurement used. For example, with individuals with long-term schizophrenia, Lysaker and colleagues (2012) found that metacognition as assessed with the metacognition assessment scale was related to social functioning, whilst social cognition assessed by a laboratory task battery was related to negative and disorganized symptoms.

MacBeth and colleagues (2014) reported that lower scores for metacognitive understanding of other's minds were significantly correlated with greater negative symptoms, poorer early adolescent social adjustment, and poorer clinician rated help-seeking in FEP sample. In this study, no correlation was found between self-reflection and negative symptoms, contrary to other studies of adults with schizophrenia (Lysaker et al., 2005; 2007; Nicolò et al., 2012; Mitchell et al., 2012).

One possible explanation of MacBeth and colleagues' findings is that, to date, metacognition has been analyzed only at the level of its broader domains, according to the three-component structure of the Metacognition Assessment Scale-Adapted (MAS-A; Lysaker et al., 2005), which measures self-reflection, awareness of others' minds, and mastery. In contrast, MacBeth et al (2014) used the MAS-R (Carcione et al., 2010), which does not just yield single sub-scale scores, but permits an item-by-item assessment. We applied this approach as a secondary analysis of data from MacBeth et al's 2014 cohort. For example, people are assigned a score for distinct elements, such as the ability to identify emotions, to understand emotional antecedents and consequences, and to take a critical distance from firmly held beliefs. Reporting of the MAS by overall sub-scale scores obscures potential associations between specific aspects of metacognition

and pathology or social functioning. Support for this approach comes from Bo and colleagues (2014) who, using an assessment battery including the MAS, demonstrated separation between the ability to identify cognitions in others from the ability to identify affects. We hypothesized that a similar approach exploring associations between specific metacognitive dysfunctions, symptoms, premorbid adjustment and service engagement could be detected for an FEP sample via item level analysis of the MAS-R.

Likely candidates for associations with negative symptoms and service engagement were aspects of self-reflection, understanding other minds and mastery. In the self-reflection domain, problems may be related to deficits in the ability to reason about mental causality, for example how events trigger an emotion this is mediated by cognitive interpretations and how behavior is activated by cognitions and affects.. When people lack the ability to understand what drives their reactions and behaviors, it is unlikely that their social functioning will be effective.

A second key ability is differentiation; defined as the ability to consider one's ideas about interpersonal matters as subjective. Rigidly sticking to one's original interpretations of events and not swiftly changing perspective according to discrepant incoming information may lead people to hold negative views of the self and others without questioning them and make them unable to solve conflicts or agree shared plans. Again, persons with poor differentiation may show social impairments and their ability to seek help may be significantly hampered. There is also the possibility that poor differentiation may also impair help-seeking prior to first contact with services - in the Duration of Untreated Psychosis (DUP) phase. Although there is a known association between prolonged DUP and poorer outcomes (Penttilä, Jääskeläinen, Hirvonen, Isohanni, & Miettunen, 2014) evidence is limited regarding associations between DUP and metacognition. There is also some evidence that poor help seeking (or engagement with services) once in treatment is associated with greater impairment in FEP (MacBeth et al.., 2013).

Finally, the inability to synthesize different aspect of self and others in a coherent psychological portrait (metacognitive integration) may hamper the remembering of positive aspects of the relationship in moments of distress, and this will promote disengagement by the individual. We therefore hypothesized that lower levels of cognitive and emotional identification, and the capacity to integrate these, unlike the overall sub-scale scores, would be correlated with negative symptoms and helpseeking within treatment (service engagement). We also predict a specific role for aspects of awareness of others. Both the inability to understand the motives that drives other actions and to decenter, that is to abandon own perspective and see the world with the eyes of the others may prevent sustained social contact and understanding the perspectives of caregivers,

thereby reducing adaptive help-seeking (both in the DUP and after initiation of treatment) and social adjustment.

Methodology

Participants were 20 males and 14 females presenting to Early Intervention for Psychosis services in two Scottish cities. Mean age (SD) of participants was 23.3 years (s.d. = 7.6 years, range = 15-45 years) and the median duration of untreated psychosis was 20.5 weeks (range = 1-520). The majority of participants were prescribed antipsychotic medication. Individuals were eligible if they were in the first 12 months of treatment for first episode psychosis, defined as presentation to clinical services with psychotic symptoms for the first time, with positive psychotic symptoms of sufficient severity and/or distress to require antipsychotic medication; meeting DSM-IV criteria for an affective or non-affective psychotic disorder (APA, 1994); substance misuse, head injury or organic disorder not judged to be the primary cause of psychotic symptoms; and capacity to consent. Identification of participants was facilitated through collaboration with clinicians. The study received review and ethical approval from Greater Glasgow and Lothian Research Ethics Committees (REC: 04/S0703/91), and received managerial approval from the local Research and Development Departments in Lothian and Glasgow. All participants gave voluntary and informed consent to participate in the study. With regard to treatment, 81% of the sample received atypical antipsychotic medication at first contact with services for psychosis, rising to 90% at 6 months after treatment initiation. Psychological interventions were being accessed by 37% of participants in the first 6 months of treatment, rising to 52% between 6 and 12 months. Psychological interventions did not use specific metacognitive interventions.

2.1. Measures

The PANSS (Kay et al., 1987) is a 30-item semi-structured interview of psychotic symptomatology. We adopted a five factor scoring model, yielding scores for: positive symptoms, negative symptoms, cognitive disorganization, excitement and emotional distress (van der Gaag et al., 2006). Each item is scored on a Likert scale from absent (1) to extreme (7). Inter-rater reliability estimates for PANSS subscales were adequate (all intra-class correlation coefficients >.82).

Metacognition was assessed using the MAS-R (Table 1; Dimaggio et al., 2010). This is a modified version of the MAS (Semerari et al., 2003). Scores are generated on 3 subscales designed to tap into metacognitive capacities - Understanding Ones' Own mind (UM), Understanding of

Others' Minds (UOM), and Mastery (M). Each of these subscales have specific item level identifiers denoting the capacity to identify cognitive processes, emotional processes, and relating these as aspects of subjective experience (UM1, UM2, UM3, UOM1, UOM2, UOM3). UM mind refers to the individual's comprehension of one's own mental states. UOM measures the comprehension of other individuals' mental states. Within the UM subscale there are specific identifiers denoting the individual's capacity to recognize the subjective nature of thought and to differentiate between different aspects of experience such as belief, memory, fantasy etc (UM4, UM5). There are also specific identifiers for the capacity to integrate mental state information about one's own mind into a coherent narrative (UM6,UM7). UOM measures the comprehension of other individuals' mental states. Within UOM the Decentration (D) identifier refers to one's ability to form ideas about oneself and others contextualized within the larger world. Mastery represents the ability to use knowledge of mental states to intentionally manage interpersonal conflicts and subjective distress. Lower scores on each subscale reflect greater difficulties in that domain of metacognitive ability. The MAS-R has previously been successfully applied to assessing individuals with schizophrenia under forensic care (Mitchell et al., 2010). Narratives were derived from participant Adult Attachment Interviews (AAI; Main et al., 2002) that were recorded, transcribed and anonymised before MAS-R coding. Further details of the AAI in this sample are available elsewhere (MacBeth et al., 2011). MAS-R coding was completed by two expert raters of the MAS-R, XX and XX, both of whom were blind to any other details regarding the sample. We note that the AAI rarely demands responses in terms of Mastery domains, consequently we did not run analyses concerning this domain. Demographics and treatment data were completed 12 months after initiation of treatment, based on information from case notes and key-workers corroborative report.

Duration of untreated psychosis (DUP) was measured using an unstructured interview protocol adapted from (Beiser, Erickson, Fleming, & Iacono, 1993) methodology. Information regarding the circumstances of onset and development of psychotic symptomatology was collected from the individual and (where a clear DUP could not be estimated) a carer or loved one, cross-referenced with clinical case notes, and discussed with the individual's clinician. The DUP interview was conducted when patients were no longer floridly psychotic. Date of onset of psychosis was calculated to the nearest week and transition to psychosis was indicated by presence of one or more symptoms on the positive symptom scale of the PANSS, rated as 4 or greater (indicating significant impairment). Where the exact date of onset was unclear, the date was taken as the 1st day of the month for which symptoms rated above threshold. The endpoint of the DUP was considered to be the date at which antipsychotic medication was prescribed and/or multi- disciplinary team involvement initiated (Delay to Onset Criterion Treatment); and where compliance with the

treatment plan could be ascertained at one month after initiation of treatment. We also calculated several components within the DUP, adapted from Birchwood and colleagues procedures (2013). Delay to Initiation of Helpseeking, (from DUP onset point to the point where individual begins to seek treatment, even if treatment is not via mental health services) and Delay to Treatment initiation in secondary care (the period from helpseeking beginning to treatment in mental health services. DUP estimates were established via a consensual judgement of the information gathered. This was facilitated through monthly consensus meetings between the authors.

Helpseeking after initiation of treatment were measured using the Service Engagement Scale (SES; Tait et al., 2002) a 14-item, clinician-completed scale to assess overall engagement with services. Items assess four subscales including availability, collaboration, help-seeking and treatment adherence. The scale has good reliability and discriminant validity (Cronbach's alpha = 0.76 – 0.90 for sub-scales; Tait et al., 2004).

For descriptive purposes we also include means scores for the Premorbid Adjustment Scale (PAS; Cannon-Spoor et al., 1982) a semi-structured interview that retrospectively measures level of functioning prior to onset of psychosis.

2.2. Procedures

A cross sectional cohort design was used. Interview measures were conducted by XX, XX and trained research assistants. The research team was not involved in participants' clinical care. Symptomatology was measured at the first session after consent, DUP was determined at the second session, and premorbid adjustment thereafter. The SES was completed by the patient's keyworker or psychiatrist, independently of the researcher.

2.3. Data Analysis

Data were analysed using SPSS version 21. All variables were checked for normality using the Kolmogorov-Smirnov test. DUP was transformed to its natural logarithm to improve normality. This is an accepted method for handling this variable (Melle et al., 2004). All key variables were non-parametric except transformed DUP Associations between variables were examined using Spearman correlations and t-tests for significant differences between groups. Cohen's criteria for interpreting the strength of correlations were used, whereby r=0.1–0.3 is considered a small effect, r=0.3–0.5 a moderate effect, and r=>0.5 is a large effect. As the analyses were conducted on a relatively small sample the significance level (alpha) was set at 0.05.

3. Results

Means and standard deviations for all variables are listed in Tables 2. Metacognitive Basic Requirements scores (Table 3) indicated that metacognition was engaged during the interview and the patients were aware of being persons with a mind of their own and they had inner states not inserted by others in their mind. Mean item scores for Understanding of One's Own Mind (UM), Understanding of Other's Mind's (UOM) were consistent with a 'Minimal' metacognitive understanding corresponds to basic abilities such as identifying own emotions and thoughts and having some idea of psychological causality, but not in a nuanced way. Associations between UM, UOM and symptoms are displayed in Table 4. There were no correlations between metacognition and PANSS Excitement. Metacognitive understanding of one's own mind was not significantly related to positive symptoms, except for the first Integration item (UM6), whereby lower Integration was associated with greater positive symptoms (rho=-.401). There were no associations between UOM and positive symptoms. Lower Decentration scores were also significantly associated with greater positive symptoms (rho=-.604).

With regard to negative symptoms and UM, lower levels of Cognitive Identification, Emotional Identification, Relating Variables and Integration (UM1, UM2, UM3, UM6, UM7) were significantly associated with greater negative symptoms (rho=-.332 to rho=-.522). With regard to negative symptoms and UOM, poorer metacognitive Cognitive Identification, Emotional Identification, and Relating were significantly correlated with greater negative symptoms (r=-.338 to rho=-.435). Lower Decentration scores were also significantly associated with greater negative symptoms (rho=-.470). Metacognition UM and UOM were unrelated to PANSS disorganisation symptoms. However, Lower Decentration scores were significantly associated with greater disorganisation symptoms (rho=-.472). Finally, higher scores for UM7, higher level integration of one's own thought was associated with greater PANSS emotional distress (rho = -.764)

Metacognition was unrelated to overall scores on the SES, except for a correlation between poorer UM Cognitive Identification and poorer engagement. Helpseeking within treatment was associated with multiple UM and UOM variables. Lower levels of Cognitive Identification, Emotional Identification, Relating Variables, Integration, and Decentration (UM1, UM2, UM3, UM6, D) were significantly associated with greater negative symptoms (rho=-.381 to rho=-.655).
Given the significant correlation between both PANSS Negative symptoms and PANSS Cognitive Disorganization we repeated the bivariate correlational analyses for significant associations between metacognition variables and engagement, using partial correlations controlling for the two PANSS symptom variables. When controlling for PANSS Negative symptoms the association

between UM Cognitive Identification and Engagement was no longer significant. However, this association remained significant when controlling for PANSS Cognitive Disorganization ($r=-.504$, $p<0.01$). The pattern was more mixed when controlling for PANSS Negative symptoms. The respective associations between lower UM1 Cognitive Identification, UM3 Relating variables, UOM1 Cognitive Identification, UOM3 Relating Variable scores and poorer helpseeking within treatment remained significant after controlling for PANSS Negative symptoms (r values = -.432 to -.511, all $p<0.05$). However, the previously significant associations between UM2, Emotional Identification, UM6 Integration, UOM2 Emotional Identification and Decentration; and helpseeking within treatment were no longer significant.

Metacognition was not associated with DUP. However, when DUP was dichotomized into short (< 3months) and long (>5 months) DUP an unexpected association emerged between longer DUP and higher levels of UOM Cognitive Identification ($U= 52.5$, $p=0.02$). When DUP was separated into its individual components there were no significant associations with metacognitive variables.

4. Discussion

The current paper presents a secondary analysis of patterns of metacognition in FEP patients, using an item level analysis of the MAS-R applied to data from MacBeth et al's (2014) cohort. Our data suggest that we can conclude with reasonable certainty that mental state processes were engaged during our interviews (MAS Basic Requirements were met). We report findings with regard to the association between metacognition and negative symptoms by demonstrating that the deficits in the understanding of other's mental states (UOM) extend across cognitive, emotional and integrative aspects and also in decentration. Therefore the data suggest that reductions in this capacity to identify the thoughts and emotions of the other individual and to understand the psychological processes leading them to act is associated with the paucity of affective and cognitive expression seen in the presentation of negative symptoms and reduced tendency to seek help when in distress (as operationalized in this study as within-treatment help-seeking). These findings are consistent with studies of the MAS in chronic samples (Lysaker et al., 2007; Mitchell et al., 2012; Nicolo et al., 2012).

In contrast with MacBeth et al (2014) we also identified an emergent pattern of association between negative symptoms and Understanding One's Own Mind (UM). This pattern suggested that, similar to the findings for UOM, negative symptoms were associated with specific items of UM indicating difficulties in cognitive and emotional identification, and the capacity to understand

the psychological links among cognitions, affects and behaviors within the self. Also the inability to form an integrated view of self and others was related to negative symptoms.

The item level analysis identified a similar pattern of associations between sub-optimal help-seeking and lower metacognition. This was apparent for both UM and UOM. In our sample help-seeking was rated by participant's health service keyworkers. We note that the correlations with Cognitive Identification and relating aspects of UM and UOM continued to be significant after controlling for level of Negative symptoms and Disorganization. In contrast associations with UM and UOM Emotional Identifcation and helpseeking were no longer significant after controlling for symptoms As such our findings can be interpreted as a reflection of an interactive process whereby higher UM and UOM may represent increased capacity to appreciate their own need for help, and confidence in the capacity of the treatment team to aid the individual. In contrast the emotional component of metacognition does not appear to play as clear a role here.

The data do not support a consistent pattern of association between DUP and metacognitive difficulties. There was an unexpected association between longer DUP and the ability to identify mental processes in others, although the item does not measure the accuracy of these judgements. This is a curious result, most likely artifactual from the data. However, there is the possibility that in the early stages of psychosis individuals become worried about how others appraise them. Therefore, this association may reflect a temporary coping strategy whereby the individual becomes more focused on mental states in order to detect for example minor signs of criticism, stigma or rejection. This would be consistent with the literature on threat sensitivity in psychosis (e.g. Scholten et al., 2006;Masillo et al., 2012).

We also note the lack of correlation between Differentiation and positive symptoms. We suggest that this may reflect a distinction between an FEP sample and a more chronic sample – with perhaps relatively intact capacity to differentiate mental states. Alternatively, this could be a function of the measure, as the MAS-R assesses metacognition through the interview narrative. Our interviews were conducted in a sample where the majority of individuals had already received treatment, with a corresponding reduction in positive symptoms. We did not conduct metacognitive interviews with individuals with acute positive delusions. However, it would seem likely that acute positive symptoms would considerably lower an individuals' capacity to differentiate.

Using the 5-factor PANSS model (Van Gaag et al., 2006) failed to reveal a pattern of association between the Excitement factor and metacognition. It may be the case that this variable represents more behavioural and psychomotor manifestations of psychosis and as such metacognition is not fully engaged. In contrast, the relative lack of association between PANSS Emotional Distress and overall metacognition is puzzling. It could be hypothesized that awareness

of one's own mental state could be linked to greater distress, as has been reported for attachment organization in FEP (MacBeth et al., 2011). Thus it may be the case that as our participants were a relatively small sample, in early recovery there had not yet been any emergence of prominent post-psychotic affective distress,. However there was also the absence of an association between PANNS emotional distress and helpseeking. This could be interpreted as evidence of a broader orientation towards self-reliance in this sample. We also note that metacognition assessed using the AAI, a measure of developmental attachment related narratives. It may still be possible that exploring metacognition in the context of narratives concerning recent interpersonal disturbing events would elicit a different pattern of associations. Moreover, we did not assess the mastery domain of metacognition, which leaves open the possibility the possible link that is not awareness of mental states in itself that correlates with distress, but rather the inability to use mental state understanding for purposeful problem solving (Lysaker et al., 2011d). We also note that there is a large negative correlation between distress and UM7 (integration of one's own mind). We interpret this as an adaptive stance whereby the ability to maintain a coherent sense of the self serves as a protective factor from interpersonal threats associated with psychosis (e.g. shame, humiliation, Gumley & MacBeth, 2006).

Overall, the pattern that emerged at this more fine-grained analysis, that negative symptoms and reduced tendencies to ask for help to the treating team, are associated with difficulties identifying and connecting thoughts and affects, both regarding oneself and in others. Conversely, the ability to take a critical distance from one's beliefs about social relationships was unrelated to symptoms and problems. This may suggest that the very problem in our sample was lack of appraisal of mental states and the inability to give psychological meaning to their own actions and to understand the mental processes of the others, which reduces the capacity and maybe the desire for social connection. As an aside, these data are consistent with analyses of metacognition in nonclinical sample which showed how the domain related to the detection of mental states, which includes items such cognitive and affective identification and relating variables in the self as well as integration to a certain degree, is distinct from the system aimed at reasoning about mental representations which includes differentiation (Semerari et al., 2012).

These data, although broadly weaker in the strength of correlations, are consistent with findings in chronic samples (Lysaker et al., 2007; Mitchell et al., 2012; Nicolò et al., 2012). We also note, that in this FEP sample there is a limited relationship between positive symptoms and metacognition – focusing on Integration of one's own mental state and Decentration . There are also significant correlations between Decentration and both positive and disorganization symptoms. This

suggests that there may be an emergent difficulty in the capacity to integrate this mental state information within a broader social or relational context.

Our findings are consistent with earlier data from an attachment perspective, whereby secure attachment reflects a confidence in the ability to receive help in crisis, and insecure attachment indicates a lack of confidence or capacity to effectively help-seek (Dozier & Velligan, 1994; MacBeth et al., 2011). We also note that, although we only measured within-treatment helpseeking from the perspective of treatment teams, this process may extend to carers or loved ones. For instance, there is emerging evidence that caregivers of patients with first episode psychosis (FEP) who exhibit higher metacognition had a more positive experience of parenting. This suggests that metacognitive abilities of sufferers' and relatives may influence the early course of illness is involved in creating a more positive interpersonal environment (Jansen et al., in press). In terms of clinical implications, we highlight that the emergent pattern of associations between metacognition helpseeking suggest a potentially modifiable mechanism that could shed light on the continued existence of treatment delays, even within care pathways (Birchwood et al., 2013). Existing research into pathways into care in early psychosis has tended to identify psychiatric presentation and the routes by which individuals access care (Rietdijk et al., 2011). Incorporating an attachment and metacognitive informed perspective on help-seeking difficulties within treatment could become a component of the next generation of public health interventions.

Our data yields further support to the proposition that basic aspects of the capacity to understand and make sense of mental states of both oneself and others' are disrupted in the early stages of psychosis. This dysfunction is associated with negative symptoms and reduced capacity to seek help, which may further undermine the individual's ability to form and maintain social connections. In relation to this there may difficulties in making optimum use of the benefits from and help offered by services. Further research could explore the antecedents of such a dysfunction, for example disturbances in psychodevelopmental processes, such as interpersonal trauma or abuse prior to onset of psychosis (Varese et al., 2012; Sitko et al., in press).

With regard to limitations we acknowledge a small sample size and the cross sectional nature of our results. This inevitably introduces risk of Type II errors into our analyses. We defend our approach on the grounds that this was a pilot study with the aim of identifying factors for inclusion in further studies, and to generate estimates of associations between key variables. That said, we note that even if we adopt a conservative cut-off of $p<.01$ for our analyses we still report a significant association between metacognition and helpseeking. Our participants were in a non-acute phase of illness and therefore the level of positive psychotic symptoms was reduced compared to a more distressed or acutely psychotic sample. However, we note that our participants continued

to exhibit symptomatology, particularly in the domains of negative symptoms and general difficulties. We also note that our participants were receiving care in a public health service setting, including access to dedicated Early Intervention services. Therefore our results may also reflect an effect of a multiprofessional care package. Finally, we note that the MAS-R is a significant revision of earlier iterations of the Metacognitive Assessment Scale (MAS, Semerari et al., 2003). As such we lack normative non-clinical data against which we can compare our sample with.

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These data also underscore the relevance of metacognition in the development of the next wave of psychological therapies for psychosis, for which preliminary evidence of efficacy is emerging (e.g. Gumley & Schwannauer, 2006; Lysaker et al., 2011c; Harder & Folke, 2012; Salvatore et al., 2012; Bargenquast & Schweitzer, 2013; Moritz et al., 2014). If these results are replicated, there will be a strong case for clinicians to help patients pay attention and recognize with more and more nuances their subjective experience and the mental states of the others during everyday life interactions. This should facilitate awareness of the patient's own needs, wishes, and desires and a greater understanding of others' reactions. Shaping and augmenting these abilities should provide a basis for sustaining social interactions and negotiating interpersonal difficulties when they arise.

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Table 1: MAS-R Items and Specifications

Subscale	Item Identifier	Description
Basic Requirements for Metacognition	Basic Requirements (BR)	Recognizes he/she possess mental functions and represents her/himself as an individual who thinks and feels in an independent manner.
Understanding One's Own Mind	Cognitive Identification (UM1)	Able to distinguish and differentiate his/her own cognitive operations (e.g. remembering, imagining, having fantasies, dreaming, desiring, deciding, foreseeing and thinking).
	Emotional Identification (UM2)	Able to define, distinguish and name his/her own emotional states.
	Relating Variables (UM3)	Identifies and describes the relations among the aspects of subjective experience: i.e. causes for his own thought or emotion or behaviour, the effects of a thought or an emotion, the inner or social factors influencing own actions.
	Differentiation 1st Order (UM4)	Recognises his/her thought as subjective, his/her opinions and forecasts as hypotheses, considering the possibility they change as contexts change and time passes (including the ability to take a critical distance from own beliefs). Thoughts are not considered reality per se and ideas or wishes cannot influence directly events or change reality.
	Differentiation 2nd Order (UM5)	Distinguishes belief, fantasy, dreams, memories and forecasts. Reality judgement is intact and the person is aware of when and where a scene is taking place.
	Integration Level 1 (UM6)	Able to describe in a coherent narrative the cognitive and emotional aspects of his/her own states of mind and how they were changing during time, grasping links and causal relations that promoted changes.
	Integration Level 2 (UM7)	Describes the cognitive and emotional aspects of his/her own different states of mind integrating the multiplicity – and possible contradictions – of representations in a consistent narrative.
Understanding Other's Mind	Cognitive Identification (UOM1)	Able to define and distinguish the others' cognitive operations (e.g. remembering, imagining, having fantasies, dreaming, desiring, deciding, foreseeing and thinking).
	Emotional Identification (UOM2)	Able to define and distinguish the others' emotional states.
	Relating Variables (UM3)	Able to make hypotheses about the links explaining the relationships among other's thoughts, emotions and overt behaviour, e.g. the causes behind a thought, emotion or type of behaviour
	Decentration (D)	Able to describe the other's mental state forming hypothesis which are independent from his/her own perspective and from his/her own involvement in the relationship.

Note: All items scored on 5 point scale: Scarce=1, Minimal = 2, Moderate = 3, Good = 4, Sophisticated = 5.

Table 2: Demographics, Duration of Untreated Psychosis and mean symptom, premorbid adjustment and engagement scores (n=34).

	Descriptive Statistic
Diagnosis	n (Percentage)
Schizophrenia	11 (32%)
Schizophreniform Disorder	3 (9%)
Schizoaffective disorder	4 (12%)
Delusional Disorder	2 (6%)
Bipolar Disorder	11 (32%)
Mania with psychotic symptoms	1 (3%)
Recurrent depression with psychotic features	2 (6%)
Educational Attainment	n (Percentage)
Left school before age 16	4 (11.8%)
Left school at age 16 -18	16 (47.0%)
Completed College course	4 (11.8%)
Completed University degree	5 (14.7%)
Did not complete College/University course	2 (5.9%)
Not recorded	3 (8.8%)
Self –reported ethnicity	
White British	32 (94.1%)
Other	2 (5.9%)
Onest of symptoms (weeks)	Median (Inter Quartile Range)_
Duration of Untreated Psychosis	20 (2.5 – 60)
Delay to Helpseeking	4 (0.5 – 27)
Delay to Treatment Initiation in Secondary Care	2 (0 – 9.5)
Delay to Onset Criterion Treatment	2 (1 – 21.5)
Premorbid Adjustment	Mean (Standard Deviation)
PAS Childhood Academic (Mean;	.21(.18)
PAS Childhood Social (Mean;	.19 (.21)
PAS Early Adolescence	.37 (.24)
PAS Early Adolescence Social	.18 (.19)
PANSS Subscales	Mean (Standard Deviation)
Positive	10.11 (5.6)
Negative	12.54 (5.1)
Disorganisation	14.14 (6.6)
Excitement	5.43 (3.4)
Emotional Distress	9.21 (4.2)
SES scale Total Score	7.22 (6.6)
SES Availabilty	0.79 (1.1)
SES Collaboration	1.87 (2.3)
SES Help-seeking	3.48 (2.9)

SES Treatment Adherence	1.00 (1.8)

Notes
PAS = Premorbid Adjustment Scale; PANSS = Positive and Negative Syndrome Scale; SES = Service Engagement Scale.

Table 3: MAS-R Subscales and Item level scoring

Item	Mean	Standard Deviation
BR Basic Requirements	4.21	0.89
Understanding One's Own Mind		
UM1 Cognitive Identification	3.06	1.06
UM2 Emotional Identification	2.67	1.19
UM3 Relating Variables	2.31	0.90
UM4 Differentiation 1	2.47	0.90
UM5 Differentiation 2	2.08	0.95
UM6 Integration 1	1.84	0.88
UM7 Integration 2	1.47	0.64
UM Subscale Mean Score	2.34	0.82
Understanding Other's Mind		
UOM1 Cognitive Identification	2.25	1.02
UOM2 Emotional Identification	1.84	0.85
UOM3 Relating Variables	1.81	0.75
UOM Subscale Score	1.87	0.76
Decentration	1.66	0.74

Notes
MAS-R = Metacognition Assessment Scale-Revised. UM = Understanding One's Own Mind; UOM = Understanding Other's Mind.

Table 4: MAS-R Understanding Own and Others' Minds subscales: Item correlations with symptoms and engagement

	SES Engagement	SES Helpseeking	BR	UM1	UM2	UM3	UM4	UM5	UM6	UM7	UOM1	UOM2	UOM3	DECENTR
PANSS Positive Symptoms	.265	.335	-.080	-.239	-.103	-.138	-.176	-.542	-.401**	-.026	-.268	-.134	-.263	-.604***
PANSS Negative Symptoms	.523***	.589***	-.297	-.472**	-.338*	-.332*	-.147	-.403	-.387*	-.522*	-.435**	-.338*	-.362*	-.470**
PANSS Disorganisation	.504**	.411**	.045	-.078	-.149	.022	-.033	.120	-.177	-.372	-.149	-.061	-.119	-.472**
PANSS Excitement	.250	.321	.245	.133	.233	.150	.128	-.144	.055	.350	.068	.122	.117	-.268
PANSS Emotional Distress	-.005	.009	-.038	-.079	-.190	-.084	.228	-.137	-.210	-.764***	-.228	-.329	-.152	-.220
SES Engagement	--	.905***	-.178	-.481**	-.227	-.186	-.080	.372	-.107	-.322	-.242	-.224	-.321	-.382*
SES Help Seeking	.905***	--	-.391*	-.655***	-.381*	-.453**	-.204	-.099	-.384*	-.515	-.535**	-.443**	-.603***	-.600***
Age	-.061	-.068	.249	.270	.195	.229	.370**	.385	.127	-.400	.120	-.054	.176	.172

Note: All correlations Spearmans' Rho = *r*; *p≤.10 (2-tailed); **p≤.05 (2-tailed); ***p≤.01 (2-tailed). BR = Metacognition Assessment Scale Basic Requirements; UM= Metacognition Assessment Scale Understanding Ones' Own Mind subscales; UOM= Metacognition Assessment Scale Understanding Other's Minds subscale; DECENTR = Decentration; PANSS = Positive and Negative Syndrome Scale; SES = Service Engagement Scale. Full descriptions of the MAS item levels are detailed in Table 1.